16 March 2012

Hi, Kelley. For the Dimock homewell data recently submitted, I compared chemical-specific Quantitation Limits (QLs) to respective risk-based screening levels (RSLs). (Note that in the analytical summary sheets, RSLs are referred to as "Trigger Levels.") Chemicals with QLs greater than corresponding RSLs are presented in the table below. In instances where the same chemical had more than one QL, the lower of the two QLs is listed. Summarizing in this manner does not affect the conclusions of this evaluation.

Analyte	Trigger Level	Trigger Level Units	Quantitation Limit	Quantitation Limit Units
1-Butanol	1.5	ug/mL	10	ug/mL
Benzo(a)anthracene	2.9	ug/L	4.76	ug/L
Benzo(a)pyrene	0.29	ug/L	5	ug/L
Chlorobenzenamine-4	3.2	ug/L	4.76	ug/L
Chromium	3.1	ug/L	10	ug/L
DBCP	0.032	ug/L	0.5	ug/L
Dibenz(a,h)anthracene	0.29	ug/L	4.76	ug/L
Dichlorobenzidine-3,3'	11	ug/L	60	ug/L
Dinitrophenol-2,4	30	ug/L	57.1	ug/L
Ether, bis(2-chloroethyl)	1.2	ug/L	4.76	ug/L
Hexachlorobenzene	4.2	ug/L	4.76	ug/L
Lithium	31	ug/L	200	ug/L
Methanol	7.8	ug/mL	10	ug/mL
Nitrosodimethylamine-n	0.042	ug/L	4.76	ug/L
Pentachlorophenol	17	ug/L	57.1	ug/L
Propylamine,n-nitroso di-n-	0.93	ug/L	4.76	ug/L
Pyrene-indeno(1,2,3-cd)	3	ug/L	4.76	ug/L
Tetrachlorobenzene, 1,2,4,5-	1.2	ug/L	4.76	ug/L
Thallium	0.16	ug/L	1	ug/L
Total Coliform Bacteria	0	cfu/100mL	1	cfu/100mL
Trichloroethane-1,1,2	0.41	ug/L	0.5	ug/L
Trichloropropane-1,2,3	0.065	ug/L	0.5	ug/L

By definition, the QL is the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. However, for volatile and semi-volatile compounds, the presence of a mass spectrometer during analysis allows for observations that are lower than the reported QLs. These observations are, in fact, reported by the laboratory in the Dimock data and identified during validation with a J qualifier code. This lower limit of observation is referred to as the Method Detection Limit (MDL), and is often close to zero (less than 1 ug/L). It would be prudent to ask the lab to verify MDLs, when available, for the chemicals listed in the table above on a sample-by-sample basis.

Assuming that the lab parameters presented in the validated summary sheets for the first 11 homewells are accurate and complete, the revised table, below, reflects a modified list of chemicals where QLs are greater than RSLs. This is a subset of the previous table, as it eliminates volatile and semi-volatile compounds (due to their characteristically low MDLs).

Analyte	Trigger Level	Trigger Level Units	Quantitation Limit	Quantitation Limit Units
1-Butanol	1.5	ug/mL	10	ug/mL
Chromium	3.1	ug/L	10	ug/L
Lithium	31	ug/L	200	ug/L
Methanol	7.8	ug/mL	10	ug/mL
Thallium	0.16	ug/L	1	ug/L
Total Coliform Bacteria	0	cfu/100mL	1	cfu/100mL

Of the remaining six chemicals, the following three can be removed from the list for the reasons provided below:

- The QL for methanol is very close to its RSL (only 1.3x higher). The Hazard Quotient associated with a concentration of methanol at the QL (10 ug/L) would be 1.3, which does not typically elicit an immediate action.
- For total coliform, the Trigger Level (0 cfu/100 mL) is the MCL; however, any observed colonies of this potential indicator for fecal coliform would be reported by the lab. Further, none of the 11 Dimock homewells analyzed thus far by EPA contained fecal coliform, which is the bacterial species of interest when considering adverse health impacts.
- With regard to chromium, the listed RSL (3.1 ug/L) is for the highly toxic (and far less likely) hexavalent form of this metal. The more environmentally-prevalent species of chromium (trivalent), has an RSL of 16,000 ug/L. A QL of 10 ug/L for total chromium should be sufficient to capture the presence of noteworthy levels of this metal.

The chemicals that remain are **1-butanol**, **lithium**, and **thallium**. To the extent feasible, analyses for these inorganics should strive to achieve QLs as close to the respective RSLs as possible. In the absence of that, keep in mind that all data for Dimock are being evaluated by one or more toxicologists, who are assessing trends and associations in the analytical findings. Inconsistencies or data gaps, if any, would be identified and elevated for further investigation.